Quick Setup Guide for Winlink VHF/UHF Sound Card Packet on Windows with UZ7HO Soundmodem Software TNC

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Thank you, **Mike KM6KAQ, Scott KI6SC, Brian KM6IGY**, **Lew AC6LS**, **Keith KD6PYD, Jim KM6TGJ, Ken KI7EIH, Joe AH0A, Tom N5TW,** and **Mike XE2/N6KZB** for testing, for your suggestions, insights and encouragement. And special thanks to **Phil W4PHS** and **Andy UZ7HO** whose programming skills, smart work and dedication make Winlink and sound card Packet the powerful and robust combination that it is.

This guide covers multiple sound card hardware options. Only follow the steps that are required for your specific hardware configuration.

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Get the Software

Download

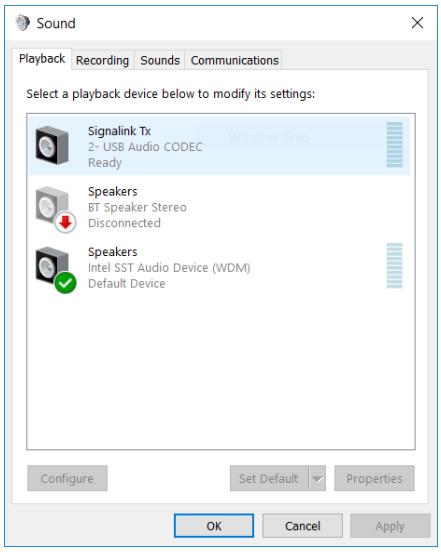
- Soundmodem: soundmodem###.zip from here http://uz7.ho.ua/packetradio.htm and extract the files in a location you can find easily. We recommend creating a folder called C:\UZ7HO\
- Also, at the UZ7HO website, download the ptt-dll.zip file and unzip this file to the same folder where you saved soundmodem. This dll is needed for PTT control on some sound cards and also CAT control of PTT. If you are using a Signalink only, this file is not needed.
- Winlink Express: https://winlink.org/WinlinkExpress

(Always check any downloads with your antivirus before executing)

Soundcard Considerations

After you have hooked up your sound card/radio, please make sure it is not selected as the Windows default audio device. You can also change the name of your device from the default Windows naming to something more descriptive. To do these steps, right mouse click on the speaker icon:

Select **Open Sound Settings,**
Under **Output**, select **"USB Audio CODEC"**
Click on **Device Properties**
Rename your device (e.g. Signalink TX)
Click the back arrow in the upper left corner
Under **Input**, select **"USB Audio CODEC"**
Click on **Device Properties**
Rename your device (e.g. Signalink RX)
Click the back arrow in the upper left corner



Click on **Sound Control Panel**

Select the **Playback** tab. Click your computer's internal soundcard (Speakers) and **click Set Default.** Then select the **Recording** tab and again

select your computer's internal soundcard (Microphone) and **click Set Default**.
There should be a green check mark on the internal sound card devices now.

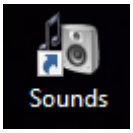
Click **OK.**

Note: The USB device names vary depending on the device type and manufacturer, and the number of USB sound devices attached to your computer. If you are not sure which device is the correct one, unplug and then replug the USB cable while watching the Sound Control Panel.

Quick Tip: Build a direct shortcut to your sound cards for quick access:

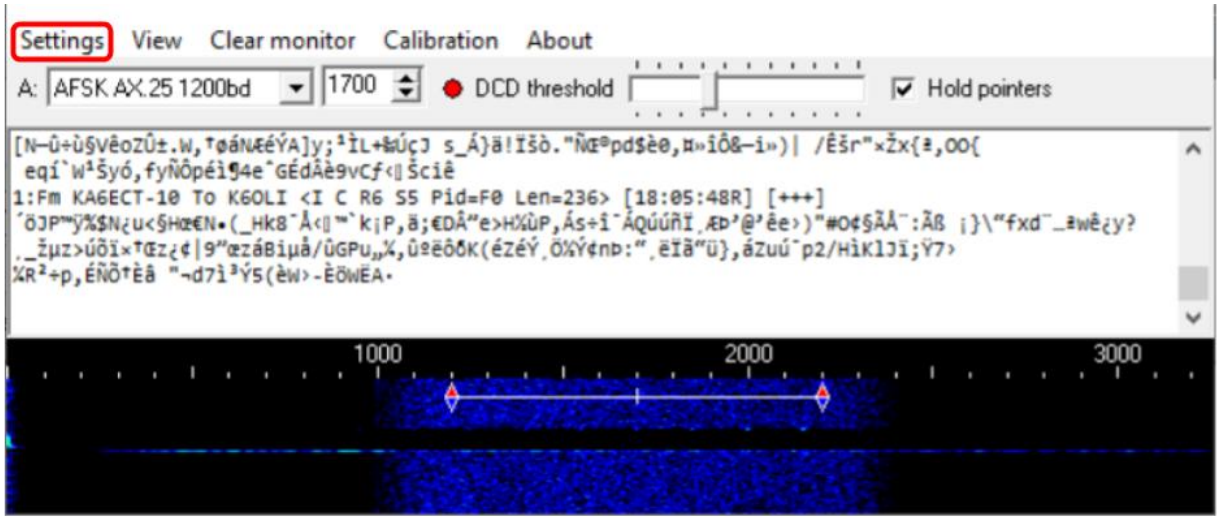
- Right-click on **Desktop**
- Select **Create Shortcut**
- In "Type the location of the item" copy and paste **control mmsys.cpl**
- Click **Next**
- Type **Sound cards**
- Click **Finish**

Customize your Soundcards Shortcut icon:
Properties -> Shortcut -> Change Icon -> paste **C:\Windows\system32\SHELL32.dll**



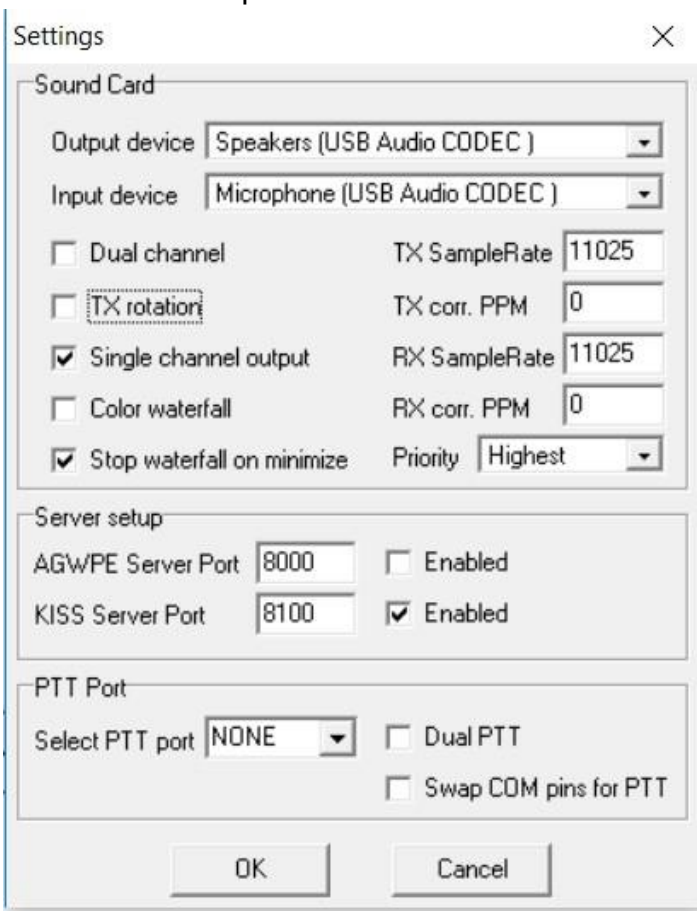
Setting up Soundmodem Devices

Go to the soundmodem.exe file you extracted earlier. Double-click to run the program.



On the Soundmodem main panel, click **Settings** then **Devices**.

You will see this panel:



Use the pull-down options to select your Output and Input devices:
Output device: **Speakers (USB Audio CODEC) [or whatever name you gave it]**
Input device: **Microphone(USB Audio CODEC) [or whatever name you gave it]**

Uncheck **TX rotation**
Check **Single channel output**
Optional: Check **Color Waterfall** (on older and slower computers leave this unchecked)
Optional: Check **Stop waterfall on minimize** (also good for slower computers)
AGWPE Server Port 8000 **Uncheck Enabled** (unless needed for other applications)
KISS Server Port **8100 Check Enabled**

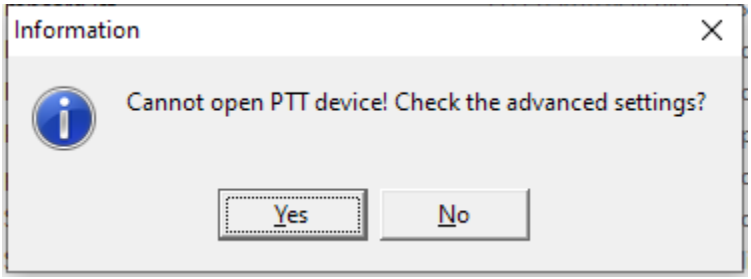
The steps below set the PTT port for different hardware configurations. Choose only the PTT option that matches your specific configuration:

Option 1 PTT Settings for Signalink

Signalink provides PTT via its internal VOX circuit, so no PTT control from soundmodem is needed. Follow these steps.
Select PTT Port: **NONE**
Uncheck **Dual PTT**
Uncheck **Swap COM pins for PTT**
Click **OK**
Continue with Modem Settings

Option 2 PTT Settings for C-Media Devices

If you are using a C-Media based sound card interface that uses GPIO pin 13 for PTT (typical of AllStar devices like the RA series, Rim Lite, etc.) follow these steps.
Select PTT Port: **EXT**
Click **OK**
You will receive an Information message that the device could not be opened, and the option to check advanced settings, click **Yes**

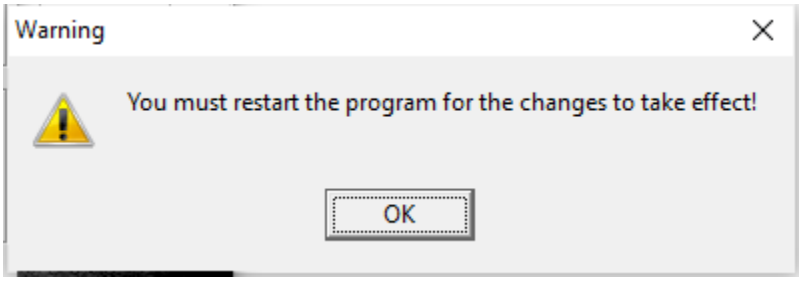


The PTT driver will search for devices and display a panel to select your device.
If you only have one device attached, this will be your only option. If you have multiple devices attached, you will have a pull-down option to select the correct one (it is possible to have multiple devices attached, and more than one copy of Soundmodem running). The test button will cause a brief PTT action to test your device. Click **Apply** to save your settings.

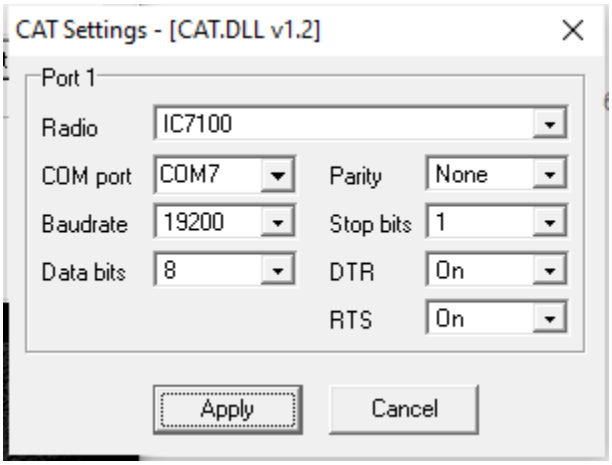
Uncheck **Dual PTT**
Uncheck **Swap COM pins for PTT**
Click **OK**
Continue with Modem Settings

Option 3 PTT Settings for CAT control

If you are using a radio with a built-in sound card, and will be using CAT/CI-V commands for PTT, follow these steps.
Select PTT Port: **CAT**
Click **OK**
You will receive a Warning message that you must restart the program, click **OK.**



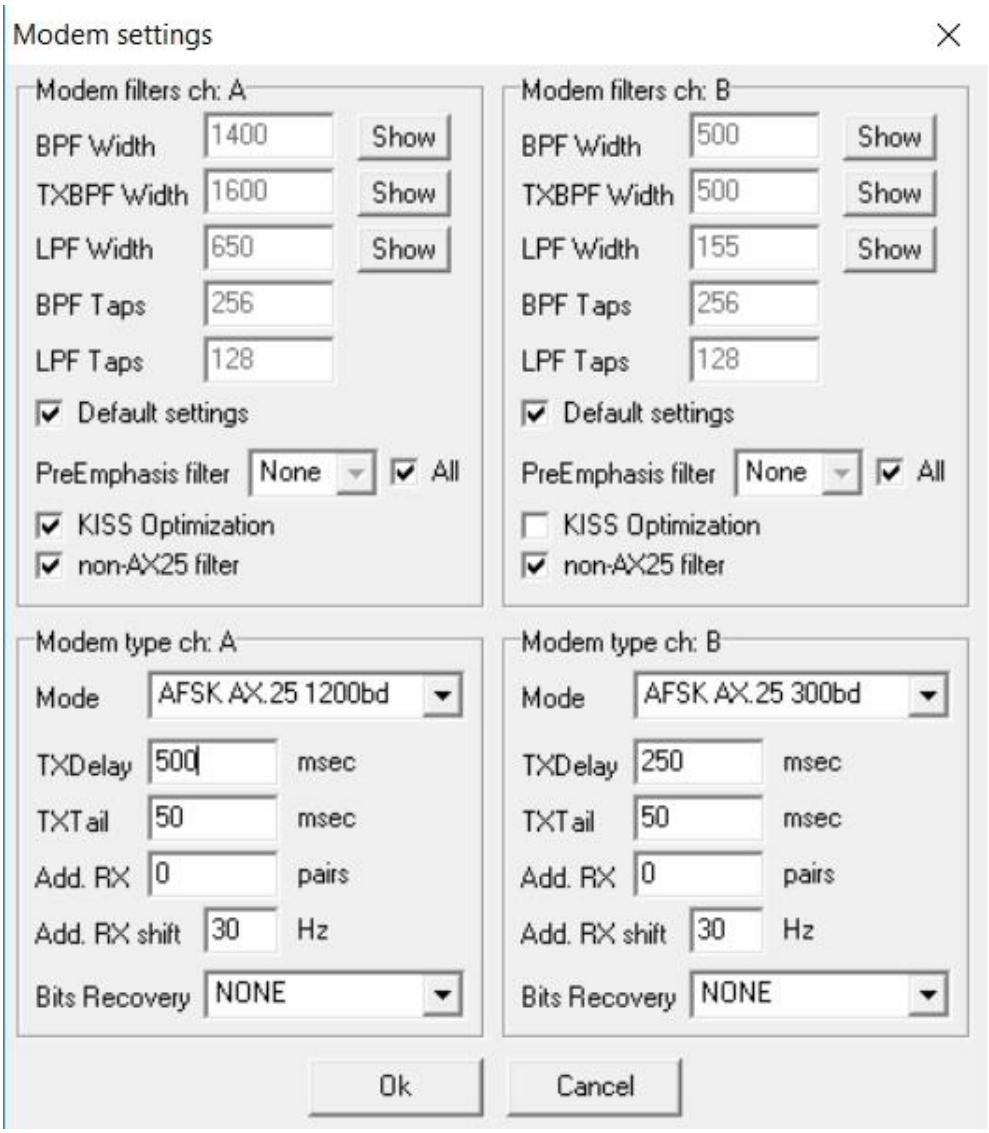
Close, and then restart Soundmodem, then on the Soundmodem main panel, click **Settings** then **Devices.**
Click on **Advanced PTT Settings**, which will bring up the CAT settings panel. Use this panel to select the radio type and communications port settings. If your specific model radio is not listed, try the generic setting for your radio's manufacturer (e.g. Icom).



The communications parameters (baud rate, Parity, etc.) must match the parameters from your radio's settings menu. The screenshot above is just an example, your settings will likely be different. Click **Apply** to save your settings.
Uncheck **Dual PTT**
Uncheck **Swap COM pins for PTT**
Click **OK**
Continue with Modem Settings.

Modem Settings

On the Soundmodem main panel, click **Settings** then **Modems**
You will only have to change settings in “Modem filters ch:A”, ignore “ch:B”



Check – **Default settings**
Check – **KISS Optimization**
Check – **non-AX25 filter**

Under Modem type ch: A
Set Mode to **AFSK AX.25 1200bd**
Enter TXDelay **500** msec

Note: TXDelay and TXTail can be adjusted over time. 500 and 50 are good starting numbers, your radio may support lower or require higher numbers.

Click **OK**

In the main Soundmodem panel make sure the modem type and center frequency are set as follows:
A: AFSK AX.25 1200bd 1700
Check **Hold pointers** (which ensures that 1700 stays set)

Adjusting TX and RX Levels

Note: Adjusting these levels properly is essential for maximum data throughput. A poorly adjusted system will result in long session times due to multiple retransmissions of packets that were not received. It is not obvious this is happening by monitoring the Winlink session panels. TX and RX levels can be adjusted by the Windows Sound settings, hardware controls (if your interface has them) and radio menu settings. All three can change the levels. You should document all these levels once they are set. Always use open squelch for data operations.

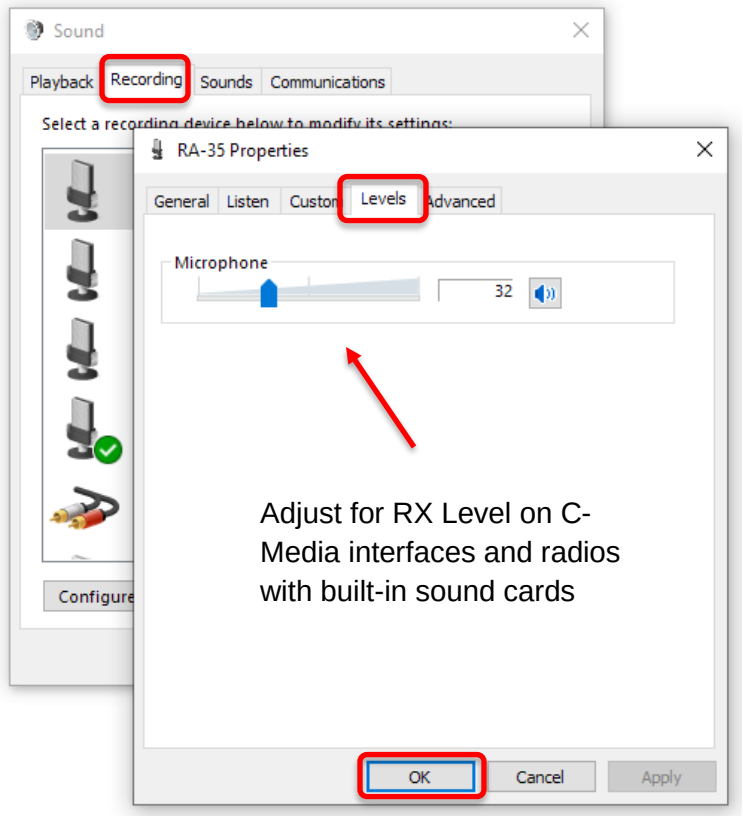
Notes for the different hardware options:

Signalink
Set the TX and RX dials on your Signalink to the 9 o'clock position as a starting point. Set DLY(delay) to the lowest setting, i.e. no Signalink delay. In Windows Sounds, set your USB Audio CODEC Speaker (Playback) level to 100%.

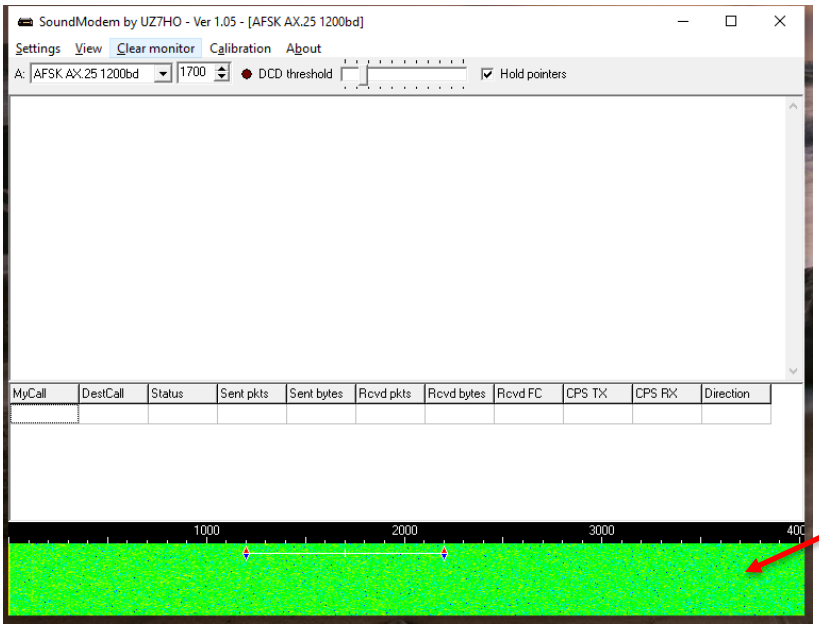
C-Media Based sound card interfaces
These devices usually do not have any level control adjustments on the board, all adjustments are done using the Windows Sound level sliders.

Radios with built-in sound cards
For these radios, TX and RX levels can be adjusted by settings in the radio menus and also using the Windows Sound sliders.

To set the RX level, use the Windows Sound Record level, and/or your device controls, to achieve a clean waterfall with the radio squelch open, and no signal being received. If you selected color waterfall, this should be blue-green color. Received packet transmissions will be yellow with some red.



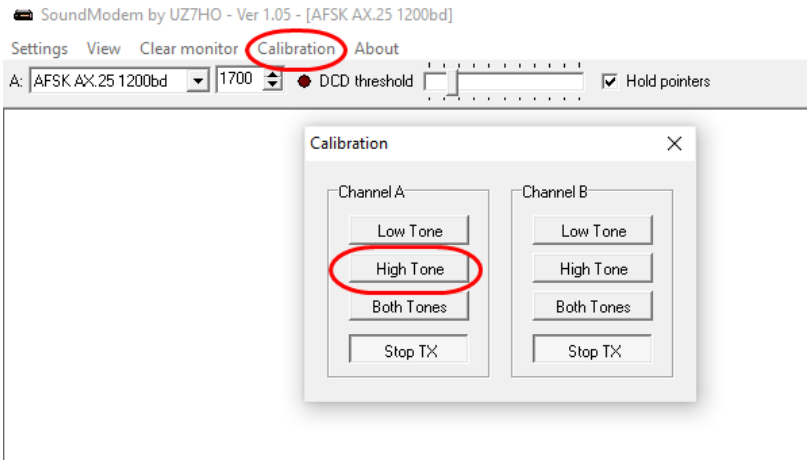
Adjust for RX Level on Signalink

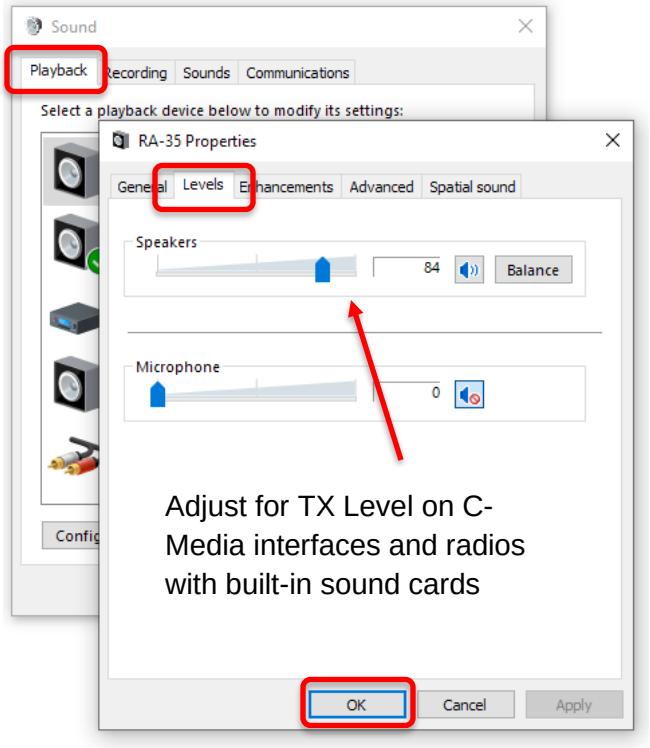


Adjust for blue-green waterfall with open squelch and no signal being received

To set the TX level, use the Windows Sound Playback level, and/or your device controls, to achieve an undistorted transmission of about 3.2kHz deviation. If you have test equipment available, this can be easily set. If you do not have test equipment, you can approximate this level using the Calibration function in Soundmodem while monitoring your transmissions with another radio.

Set your monitor radio to the same channel and adjust the volume to a comfortable level.
Set the Playback level, or TX control to a low setting.
On the Soundmodem main panel, select Calibration.
On the Calibration panel, click the **High Tone** button.
Your radio should start transmitting and the 2200Hz tone may be heard on the monitor radio.
Adjust the playback/TX level up slowly until you reach the point where further increases in this level do not increase the receive tone level on the monitor radio.
From this point, adjust the level back down just until you perceive a noticeable drop in the receive tone level on the monitor radio.
This should be close to 3kHz deviation.
Click on the **Stop TX** button.
Close the Calibration panel.





Adjust for TX Level on Signalink

Continue with Winlink Express Setup

Winlink Express Setup

Leave Soundmodem running and start RMS Express.

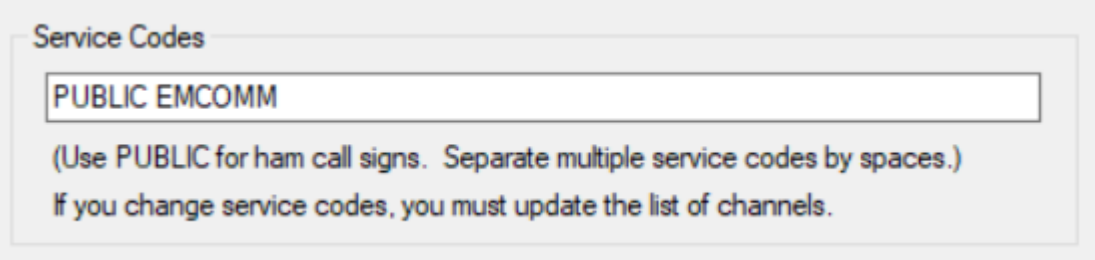
Quick Tip: Winlink Express Setup

If you have not setup Winlink Express, go to **Settings -> Winlink Express Setup** and fill in the appropriate fields.

You only have to do this once (unless your personal information or location changes, e.g. Call Sign, Registration Number, Locator, etc. then update in Winlink Express Setup).

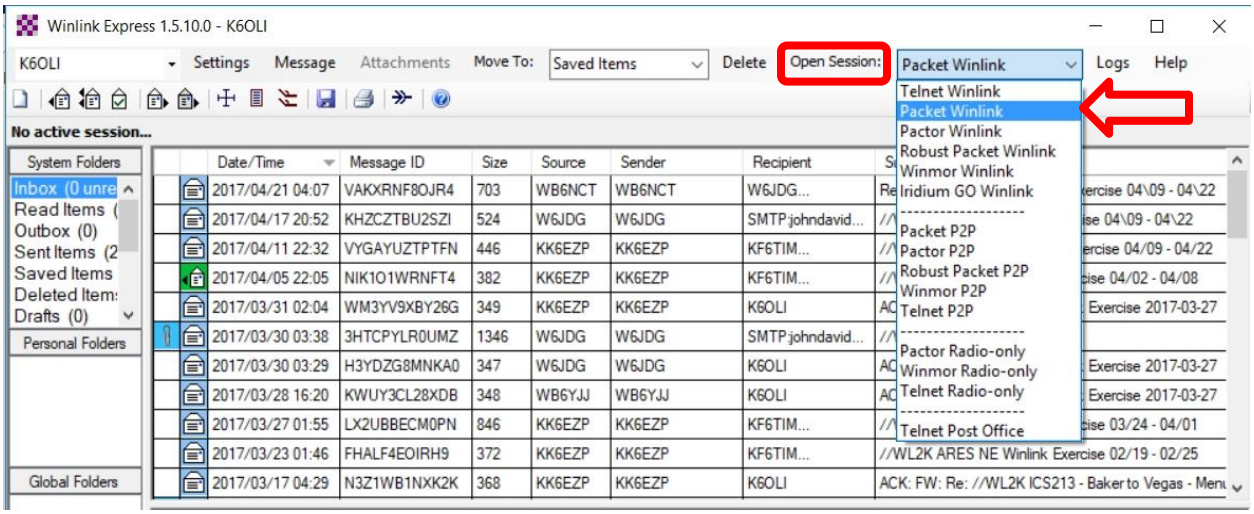
Entering your locator here will help you find Winlink Gateway stations near you. You can look up your Maidenhead Locator at
http://www.levinecentral.com/ham/grid_square.php

If you are an Emcomm station, add EMCOMM to the **Service Codes** field. It will then show both PUBLIC and EMCOMM gateways in your area.



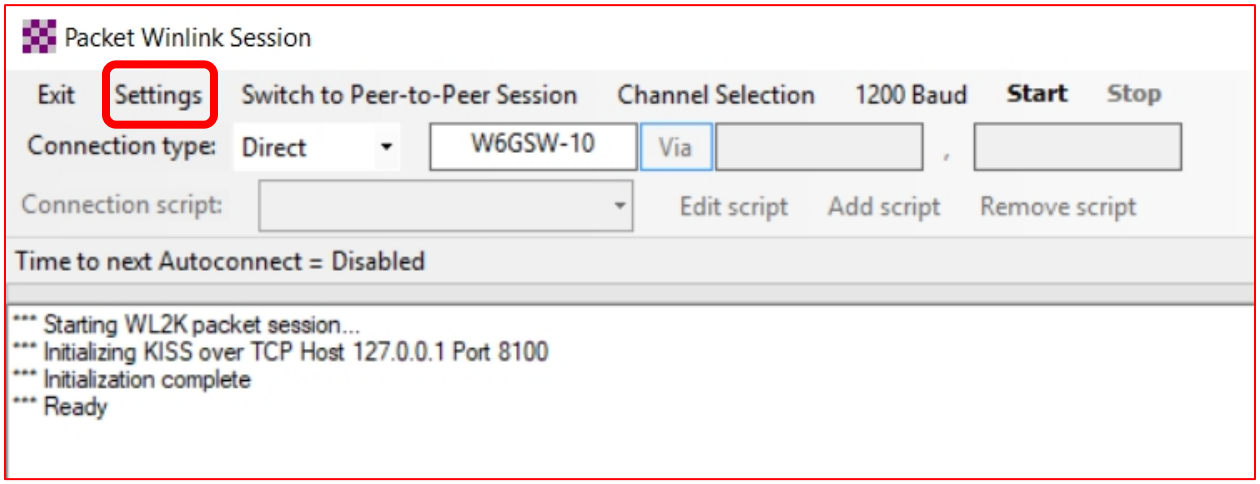
Packet Winlink

Select Open Session: **Packet Winlink**

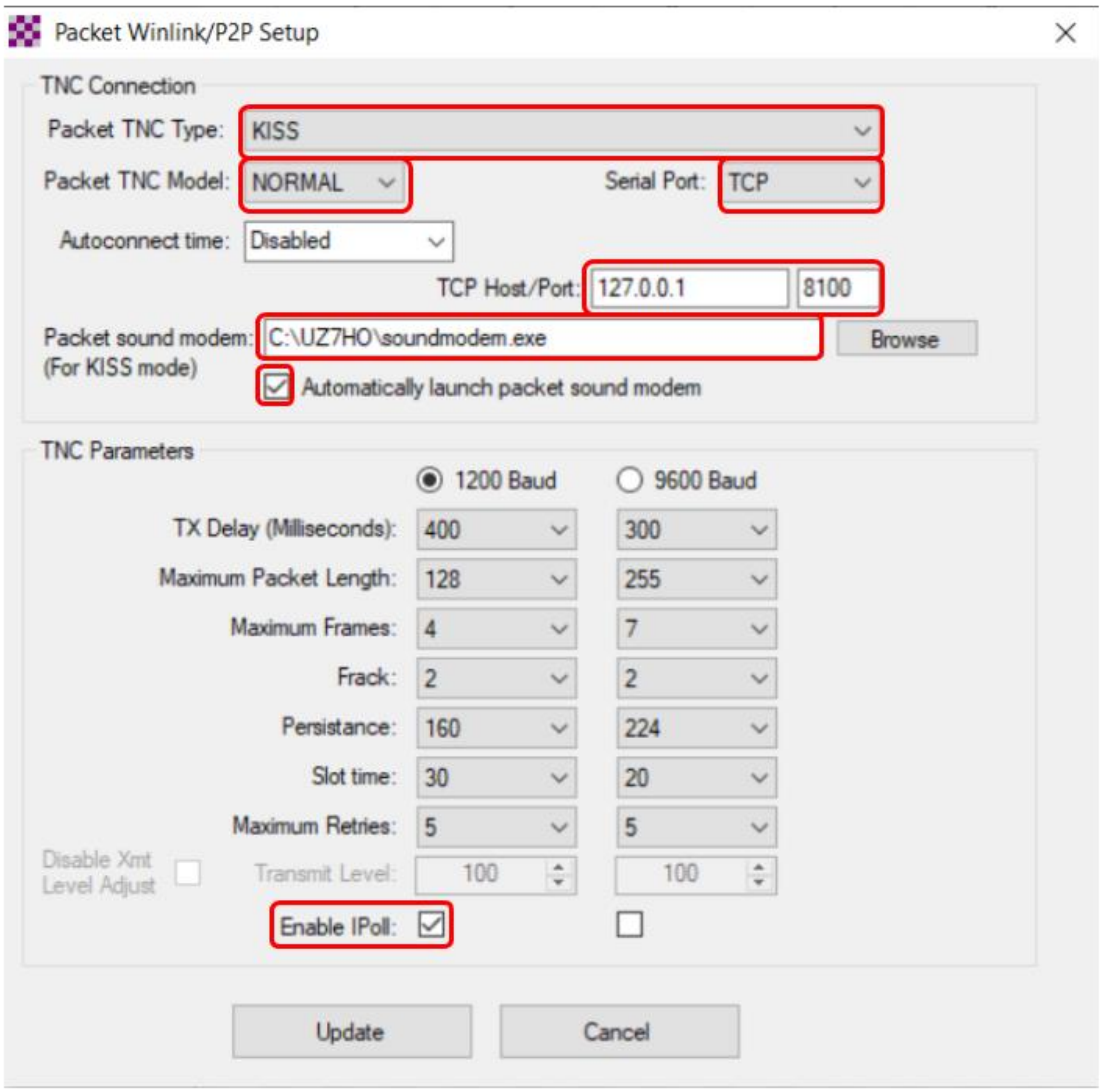


Click on **Open Session:**

You are now in the Winlink Packet Session



Click **Settings**



Select Packet TNC Type**: KISS**
Select Packet TNC Model: **ACKMODE**

Note: Choose ACKMODE for most instances. However, when troubleshooting connections, you may want to try NORMAL.

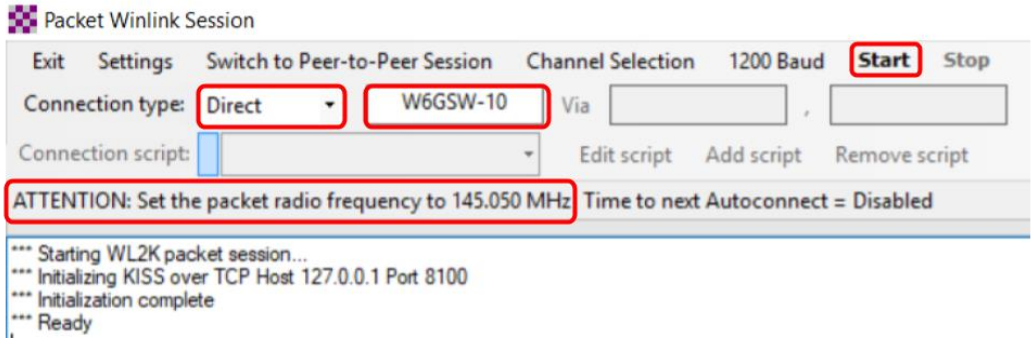
Select Serial Port: **TCP** (instead of COM port options in the dropdown menu)
Set TCP Host / Port: **127.0.0.1 / 8100**
Packet sound modem: **C:\UZ7HO\soundmodem.exe**
Check Automatically launch packet sound modem

Note:

1. Enter the path to the folder to which you extracted UZ7HO Soundmodem, in this example C:\UZ7HO\soundmode.exe.
2. If you choose to run Packet Soundmodem manually, then leave “Automatically launch packet sound modem” unchecked.
3. Running two instances of Soundmodem on the same port will return an error: “ KISS Server Port Busy”. Close all instances of Soundmodem and start only one instance of Soundmodem.
4. Some users prefer to start Soundmodem and VARA FM manually, keep them running and switch between Packet and VARA FM sessions. Soundmodem and VARA FM can be run concurrently.

Select TNC Parameters **1200 Baud**
Check **Enable IPoll**
Click **Update**

Connecting to a gateway



Select Connection Type: **Direct**
Enter Gateway name, in this example: **W6GSW-10**

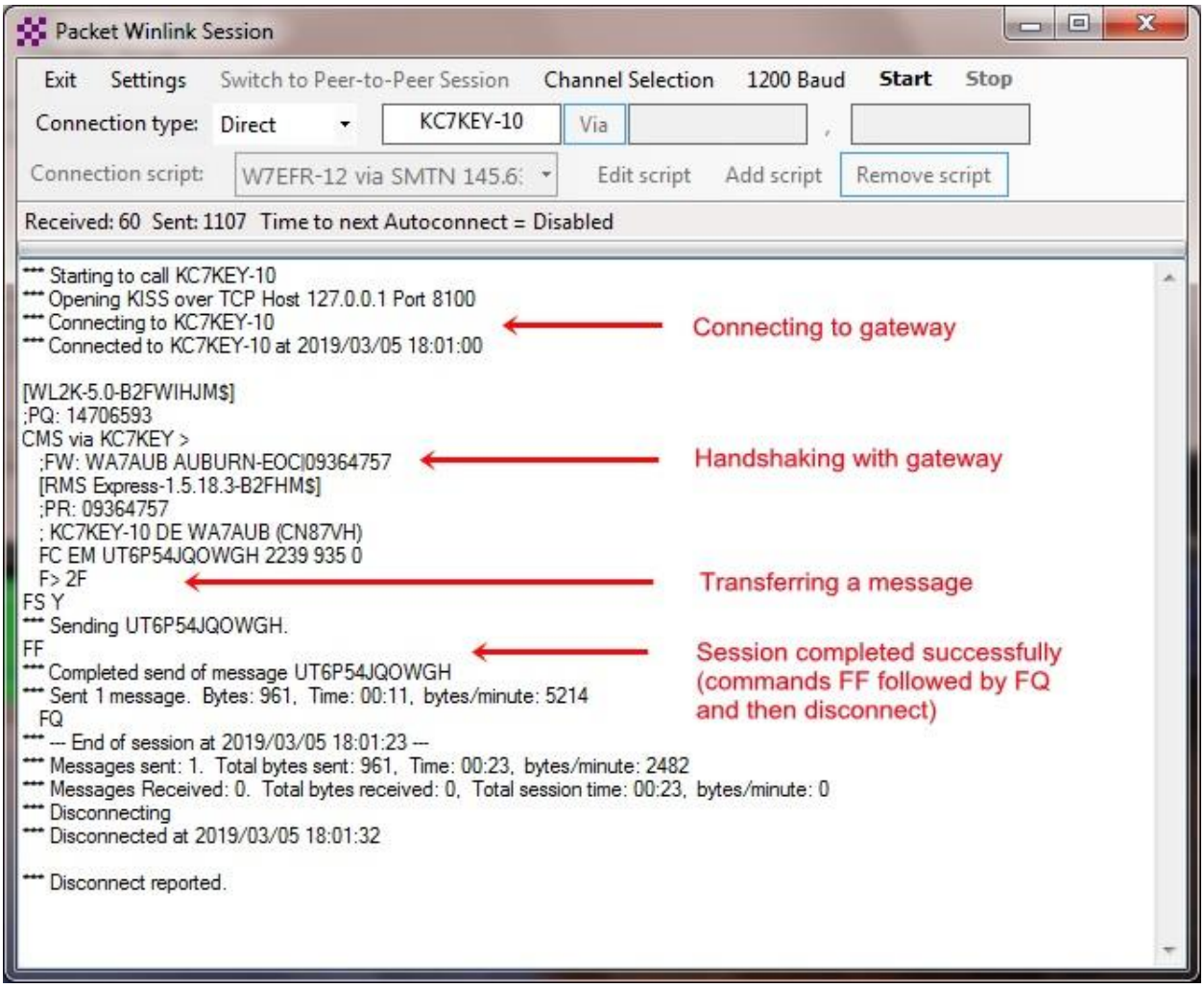
On your radio set the frequency to the gateway frequency, in this example 145.050MHz. This frequency will be different for different gateways! Use Channel Selection (see Quick Tip below) to make sure you have the correct gateway station call sign and frequency for your area.
Note: Some radios require digital mode to be enabled before you can make a digital connection on the selected frequency. Please refer to your radio manual for details.

Click **Start**

Successful Exchange

Here is an example of a successful Packet exchange with explanations.

For protocol details please see: https://www.winlink.org/B2F



Quick Tip: Channel Selection

Update your available channels on a regular basis, once a month at the very least. Using the Channel Selector automatically populates the relevant fields in the Packet Winlink Session window.

Click **Channel Selection**

Click **Update-via-Internet**

(if you have filled in your grid square correctly in Winlink Express Setup, the Channel list auto-populates with nearby stations)

Packet Channel Selector

Exit | Select Channel | Update Table Via Internet | Update Table Via Radio

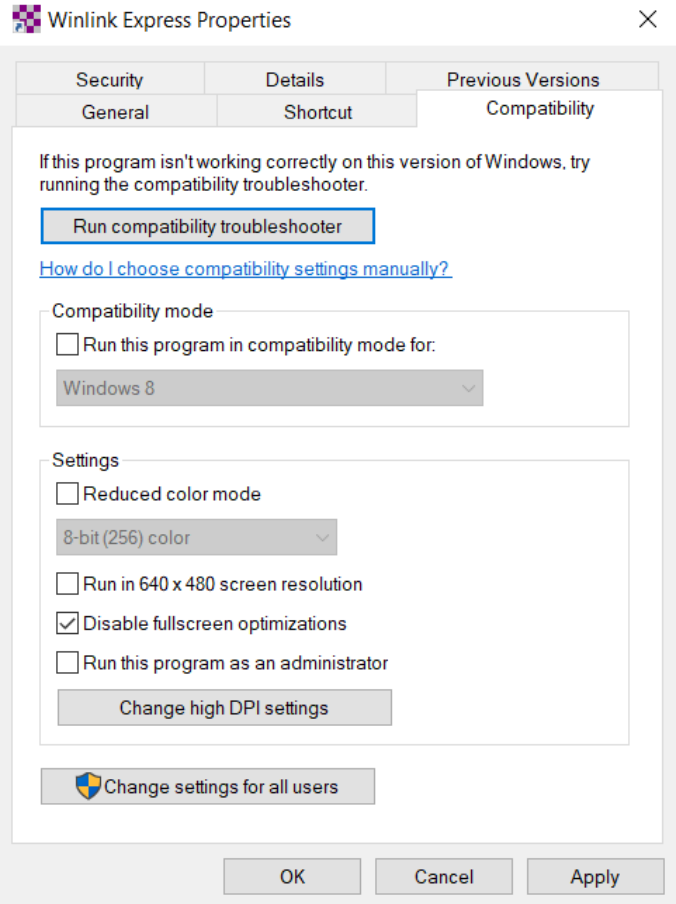
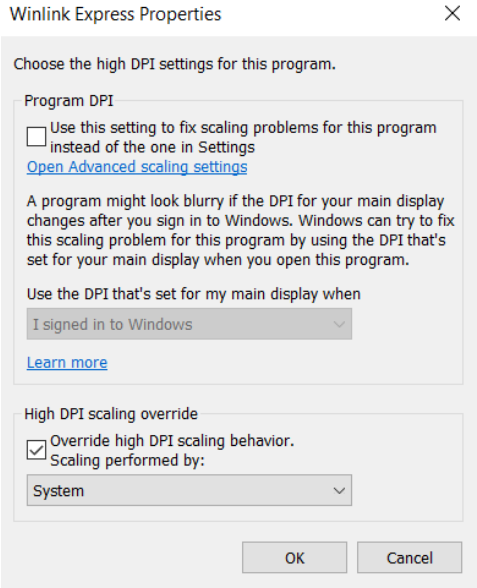
Stations found within 160 kilometers of your grid square.

Callsign	Frequency (MHz)	Baud	Grid Square	Group	Distance (km)	Bearing (Degrees)
W6GSW-10	145.050	1200	DM04WB	PUBLIC	010	180
W6GSW-10	431.125	9600	DM04WB	PUBLIC	010	180
K6HRP-10	145.050	1200	DM03WW	PUBLIC	023	180
K6HRP-4	145.050	1200	DM03WW	PUBLIC	023	180
AJ7C-10	145.050	1200	DM04TA	PUBLIC	027	238
AJ7C-10	431.125	9600	DM04TA	PUBLIC	027	238
K6CCR-10	145.050	1200	DM04TA	PUBLIC	027	238
KK6QMS-10	145.050	1200	DM03SX	PUBLIC	036	238
W6ACS-11	431.125	9600	DM13CW	PUBLIC	039	127
K6JGL-10	145.050	1200	DM03TU	PUBLIC	041	215
AG6MO-10	145.090	1200	DM14EC	PUBLIC	046	097
KE6RHV-10	145.630	1200	DM04XN	PUBLIC	046	010
KE6WEZ-10	145.050	1200	DM04PG	PUBLIC	055	284
W6CTR-10	144.970	1200	DM14FA	PUBLIC	056	105
W6ACS-10	431.475	9600	DM13DS	PUBLIC	057	137
WB6TT-10	144.970	1200	DM13FU	PUBLIC	064	121
K6NBR-10	145.050	1200	DM13BO	PUBLIC	065	159

Double-click the gateway station you want to use.

The Packet Winlink Session window will read **ATTENTION: Set the packet radio frequency to xxx.xxxMHz**, this also gives you the frequency you should set your radio to.

Quick Tip: Winlink Screen Resolution Fix

In some cases, the Winlink panels will resize as Windows tries to optimize the screen resolution. This can make the panels painfully small to read. You can keep this from happening by following these steps:

Right mouse-click on the RMS Express icon.
Select <Properties>
Select the <Compatibility> tab.
Check <Disable full screen optimizations>.
Click on <Change high DPI settings>
Check <Override high DPI scaling behavior>.
In the <Scaling performed by> drop-down box **select** <System>
Click **OK.**